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DYNAMIC FUNCTIONAL NETWORK CONNECTIVITY COMPARING AUDITORY VERBAL HALLUCINATIONS IN PSYCHOTIC AND NON-PSYCHOTIC SUBJECTS

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functioning. We hypothesized that GM volumetric differences are associated with both familial and clinical risk for schizophrenia

Methods: We processed the T1-weighted MRI scans acquired at 3 Tesla of 544 HC, 63 SIB, 20 CHR and 120 SCZ using CAT12. We used ANCOVA to assess group differences (HC vs. CHR vs. SIB vs. SCZ), with linear and quadratic age, gender and total intracranial volume as nuisance covariates. We assessed the reproducibility of our case/control findings in an independent sample of 127 HC and 36 SCZ. Group differences were tested post hoc through Fisher's test.

Results: We found significant group effects in the bilateral thalamus, bilateral hippocampus and anterior cingulate ($FWE < 0.05$). Specifically, SCZ presented the lowest GM volume in these regions compared to the other three groups, with SIB and CHR's GM estimates intermediate between HC and SCZ ($p < 0.05$). The associations with schizophrenia were replicated in the independent validation sample.

Discussion: Individuals with familial or clinical risk for schizophrenia have lower GM estimates in the same brain regions. These findings, suggest that these structural features are not only associated with familial risk for schizophrenia but that they are also associated with its sub-threshold symptoms.

S160. ALTERATIONS IN SHORT-RANGE STRUCTURAL CONNECTIVITY ACROSS THE PSYCHOSIS SPECTRUM: FINDINGS FROM THE B-SNIP STUDY

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Background: Schizophrenia (SZ) and bipolar disorder (BD) have been increasingly viewed as psychotic mood disorders along a shared spectrum. Long-range and short-range structural connectivity have been implicated in both disorders, conceptualising them as "disconnection syndromes". There has been a rise in neuroimaging tools to understand the overlap and boundaries between the two disorders, which has shifted our focus towards appreciating traits in addition to diagnosis. Our recent pilot study examining short-range U-fibers found in superficial white matter (SWM) found shared and distinct traits among people with SZ and BD and we aimed to investigate SWM further using data from the Bipolar-Schizophrenia Network on Intermediate Phenotypes (B-SNIP) consortium.

Methods: Using diffusion weighted imaging (DWI), we performed whole brain tractography in 113 people with SZ, 69 people with SA disorder, 49 people with psychotic BD and 77 healthy controls using BrainVISA and Connectomist 2.0. Segmentation and labelling of SWM tracts were performed using a comprehensive U-fiber atlas. ComBat was applied to remove site effects and principle components analysis was performed to identify networks of bundles used for comparative analyses.

Results: Principle component analysis revealed a network comprised of 8 short tracts in frontal, parietal, and temporal regions that had decreased anatomical connectivity in patients, regardless of diagnosis, relative to healthy controls. This network overlaps, in part, regions that differed between patients (SZ and BD) and healthy controls in our recent pilot study. However, we were unable to detect differences between people with SZ, SA disorder and psychotic BD.

Discussion: We demonstrate that short U-fibers are likely vulnerable to pathological processes in psychotic illnesses, encouraging further understanding of their anatomy and function. Our lack of findings between patient groups may reflect a more homogeneous population (three subgroups of psychosis) and may suggest that abnormalities in SWM are less likely due to mood disturbances.

S161. DYNAMIC FUNCTIONAL NETWORK CONNECTIVITY COMPARING AUDITORY VERBAL HALLUCINATIONS IN PSYCHOTIC AND NON-PSYCHOTIC SUBJECTS

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Background: Auditory verbal hallucinations (AVH) are often seen as a hallmark of schizophrenia, but can also occur in the general healthy population. While AVH in non-clinical populations might offer an opportunity to study them in isolation, it remains debatable whether the mechanisms underlying AVH are the same in clinical and non-clinical populations. For example, non-clinical populations are reported to attribute lower emotional valence to their AVH. Such differences in phenomenology are hypothesized to arise from differences on the neurobiological level. With the current study, we employ a data-driven approach to define brain networks involved in AVH in clinical and non-clinical subjects, and test whether dynamic differences in network connectivity exist between these groups.

Methods: Functional magnetic resonance imaging data of 21 non-psychotic individuals and 21 matched psychotic patients with frequent AVH were obtained. During scanning, subjects manually indicated the on- and offset of their AVH. Using independent component (IC) analysis, the data were split into 72 statistically independent spatial maps and their time courses. These time courses were regressed with the AVH time courses. With a one sample t-test on the beta weights, we selected those ICs that related to AVH in both groups for further dynamic functional network connectivity analysis. To identify functional connectivity states, k-means clustering was implemented on correlation matrices acquired using sliding windows. Group differences between these states were determined with two-sample t-tests.

Results: Both groups experienced AVH during scanning, with a mean number of 24.71 AVH episodes in the clinical and 17.14 episodes in the non-clinical group. We identified seven ICs with time courses significantly related to the occurrence of AVH in both groups. The auditory, sensorimotor, and posterior salience network were positively related to AVH occurrence. The ventral default mode network (DMN), anterior salience network and a network consisting of (para-)hippocampal areas were negatively related to AVH.

While in general, networks related to AVH were similar in both groups, a significant difference between the two groups was found in the mean dwell time in states characterized by varying connectivity between these networks. Psychotic patients spent more time in a state of low connectivity ($r < 0.055$) between all AVH-related networks. Non-psychotic patients dwelled longer in a different state, where some weak correlations between networks were present ($.15 > r \geq .10$). Specifically, networks positively related to AVH showed small negative correlations with each other, and a small negative relationship with the DMN. At the same time, the anterior salience network displayed a small positive relationship with the sensorimotor, auditory and posterior salience networks.

Discussion: Our findings suggest that similar brain networks underlie AVH in non-psychotic and psychotic individuals, but that the groups differ in terms of connectivity between those networks. Among the involved networks are those typically associated with AVH in psychotic patients, such as the DMN and auditory network. During the experience of AVH, psychotic individuals are more likely to show a state defined by segregation of the AVH-related networks. On the contrary, during AVH non-psychotic individuals are in a state defined by more connectivity between the networks. This suggests that a distinction between clinical and non-clinical AVH may have its neurobiological basis in the extend of disruption of involved network connectivity.